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ABSTRACT

In an examination of two alternative hypotheses about the role played by pauses in the planning of writing, this paper focuses on the long, "pregnant" pause. The first section of the paper examines the two alternative hypotheses about planning, one based on the theoretical perspective of linguistics and the other on the assumptions of rhetoric. The second section presents a new body of research on episodic patterns, termed "composing episodes," within the writing process itself. It contends that when these episodes are observed through protocol analysis, they appear to be the major planning units in which writers work. The paper argues that neither paragraph boundaries nor sentence level shifts in idea development are good predictors of episode boundaries but that goal-related planning is. It concludes that these findings might be used in locating possible ways in which linguistics and rhetorical planning might interact. (FL)

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THE PREGNANT PAUSE: AN INQUIRY INTO THE NATURE OF PLANNING

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The Pregnant Pause: An Inquiry Into the Nature of Planning*

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Recent research in composing has caused us to reexamine some of our assumptions about how writers plan. For instance, there are now a number of observational studies--ones which describe content-free "writing behaviors" of writers at work--which suggest that writers do very little "pre-writing" or thinking before attempting to transcribe (Pianko, 1979; Perl, 1978). Instead, writers spend large amounts of time pausing during writing--in some cases 70% of composing time is actually "pause time" (Gould, 1980; Matsuhashi, 1978). These observations have led to both research and speculation: What happens as writers pause? And if pausing reflects planning, as many assume it does, what is the nature of that planning?

This last question is especially provocative because it tends to elicit two quite different answers, one based on the theoretical perspective of linguistics and the other on the assumptions of rhetoric. And these two significantly different perspectives drive much of the current research in writing. In this paper we will examine two alternative hypotheses about the role of pauses in order to explore both planning itself and the theoretical paradigms which drive research on it. We will focus on the most perplexing sub-set of these pauses--the long, "pregnant" pauses--and ask the question, "Why do writers pause?"

Our paper will be organized into three sections. In the first section we will examine the evidence for both the linguistic and rhetorical hypotheses about planning. In the second section we will present a new body of research on episodic patterns within the writing process itself. These composing episodes, which one can observe through protocol analysis, appear to be the major planning units in which writers work. Since much of the significant pausing and planning one observes in writers appears to occur at the beginning of these episodes, we will use protocol analysis to look at the content and nature of these plans. In the final section, then, we will look at how effective the linguistic and rhetorical theories are at predicting the planning that actually occurs at episode boundaries. And we will use these results to suggest how both kinds

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of planning might interact.

HYPOTHESES

Our first hypothesis, which we can call the linguistic hypothesis, can be briefly stated as, "writers pause in order to generate or plan what they are going to say next." According to this common sense position, the work of writing is the work of thinking up a sequence of connected sentences, i.e., producing a sustained piece of prose. This sequence is of course shaped by many constraints such as overall purpose and the conventions of the genre, but the process of composing and the content of planning are directly related to the production of text. This then is a text-based perspective on the writing process.

Our second hypothesis, the rhetorical hypothesis, says that "when people pause for significant lengths of time, they pause in order to carry out more global rhetorical planning or problem-solving which is not necessarily connected to any immediate utterance or piece of text." From this perspective much of the work of writing is the effort to consciously integrate one's knowledge, purpose, and audience by doing relatively abstract rhetorical planning. This then is a basically rhetorical perspective on composing as a problem-solving process.

Obviously, these two hypotheses are not mutually exclusive; one of the goals of this paper will be to discuss how they are related. However, they represent two quite distinct lines of inquiry in current research--the bottom-up work of linguistics vs. the top-down approach of cognitive psychology and rhetoric--and they represent two significantly different models and sets of assumptions about what is crucial in the writing process. Therefore, for the sake of examining this theoretical division as well as the empirical issue of pauses, this paper will pursue the implications of our rival hypotheses. We will look first at the support for each hypothesis and then at a set of studies which used protocol analysis to look more closely at the content of the writer's thought during pausing.

Planning What to Say Next

There is a good deal of support for the hypothesis that pauses reflect sentence-level linguistic planning: some of it is empirical, some simply based on common assumptions about

writing.

To begin with, the work of Matsuhashi convincingly demonstrates the presence of sentence-level planning and shows ways in which it is sensitive to the complexity of the writing task (1979). Drawing on the work of Frieda Goldman-Eisler and Wallace Chafe, which measured pauses in oral speech, she found that in writing, the length of pauses before relevant T-units increases as the task becomes more difficult. When writers are trying to persuade or generalize, they pause an average of 5 seconds more per T-unit than when simply reporting or narrating ($\bar{X}$ reporting = 7.5645; $\bar{X}$ generalizing = 12.5679) (Matsuhashi, 1980). Pauses are also related to the level of abstraction of the following thought: pauses before superordinate T-units last significantly longer than before coordinate ones. Finally, writers pause an average of 6 seconds longer before transcribing the beginning sentence of a paragraph than before other sentences ($\bar{X}$ paragraph sentence = 15.100; $\bar{X}$ non-paragraph sentence = 8.999) (1980).

Further evidence that pausing and planning are directly linked to text production comes from the common observation that writers frequently reread their current text, pause, and write some more. Perl, who found that her five Basic Writers constantly returned to the assignment or to their previous sentence as a sort of jumping-off point, argued that this distinctive ebb and flow pattern was a chief characteristic of their composing process (Perl, 1980). Indeed this apparent dependence on sentence-level planning might be predicted from Shaughnessy's description of Basic Writers which noted in them: a preoccupation with local problems and a fear of producing error, a reluctance to play upon ideas or return to central points, and a strong concern with the flow of words and sentences (Shaughnessy, 1977). An additional study of our own suggests that poor college writers depend heavily on sentence-level planning which is riveted to the topic. We used a protocol study to examine the nature of all new ideas students generated in the course of writing an essay and found that 60% of the new ideas generated by the good writers were in some way responsive to the larger rhetorical problem (that is, they recognized the audience, the genre, etc., as well as the topic). By contrast, the poor writers generated over 70% of their new ideas in response to the topic alone or to the last element under consideration (Flower and Hayes, in press, b).

Taken together, these studies suggest that an <u>exclusive</u> dependence on sentence-level planning

may in fact be one of the marks of a poor writer. However, Britton and his group have also demonstrated how crucial sentence-level planning is in handling larger rhetorical tasks. In an informal experiment in which a non-marking pen prevented writers from reviewing what they wrote, they found it easy to write narrative, but quite difficult to produce more complex theoretical or argumentative prose if one couldn't review the previous sentence to plan the next (Britton, 1975). It is perhaps understandable that most of the research which demonstrates sentence-level planning comes out of linguistic studies of oral speech focused on either narration or conversation (Clark and Clark, 1977). In these areas sentence-level planning is crucial. It would be odd, even inappropriate if speakers planned a conversation very many moves in advance. As Bereiter and Scardamalia have shown, children learn to write by learning to move from the sentence-level planning strategies of conversation to the whole-text planning required by writing (1981).

To sum up, the sentence-level planning described in our first, linguistic, hypothesis, is demonstrably important to both speech and writing. However, the problem arises when we assume that this model of planning can, by simple extrapolation, adequately account for the production of more complex expository prose. Here the evidence moves to the shakier ground of popular assumptions.

Pianko quotes her freshman subjects as explaining that "the great majority of their pauses were for planning ahead--what to write next--and that most of their rescannings were to reorient themselves to what they had just written for the purpose of deciding what to write next" (Pianko, 1979, p. 10). This common sense assumption and its implicit model of planning has many sources. For one, it reflects the give and take pattern of planning conversation. But more importantly, it is a model of the writing process based on an image of the written product--that linear sequence of sentences, each of which builds on the one before. Christensen's "generative rhetoric" of the cumulative sentence and the paragraph has shown us how powerful this building block approach can be for descriptive writing (1966). And it seems an easy step from the cumulative sentence to the cumulative essay and to an implicit model of the composing process which operates with primarily local, sentence-by-sentence planning. The best description of this kind of planning comes from Britton who calls it "shaping at the point of utterance." "We focus

on the end in view [this refers, apparently, to a tacit representation of one's purpose] shaping the utterance as we write; and when the seam is 'played out' or we are interrupted, we get started again by reading what we have written, running along the tracks we have laid down" (1974, p. 24). This railroad metaphor, much like Perl's graphic ebb and flow image, captures the pattern of pause and production that Goldman-Eisler also saw in conversation. But decision making at the sentence level may be only part of the picture in writing. As Britton himself says, "It is tempting to put it simply as, 'We pause while we decide what to write down next,' but that doesn't help us to know how the decision is controlled" (1975, p. 41).

Rhetorical Planning

Our second, rhetorical, hypothesis focuses on the higher-level planning which could guide such local decision making in writing. This hypothesis is based on a hierarchical rather than linear model of the process which views composing as guided by a network of plans and goals. The top-level goals in such a hierarchy may be quite abstract, such as "make this part interesting," whereas middle range goals may be much more operational and clearly related to a textual choice, as in "So I'll start with a list of jobs they might consider." These plans, as in the following excerpt from the middle of a protocol, are rhetorical ones that consider the audience and the writer's goals and, unlike a tacit representation of the "end in view," they take time and effort to work out. The writer in this example is in the middle of writing about her job for an article for Seventeen magazine and has paused to plan.

> "I'm trying to really not so much to talk about my job [the topic], which--a--is not a--I'm not sure it would be of great interest to a twelve-thirteen-fourteen year-old girl, but my sense is that what would be interesting to them would be how I decided to do it or the extent to which--um--the myths about choosing an occupation are myths."

In this rather complex instance of planning the writer is exploring possibilities and setting up tentative, even alternative goals. In considering possible ways to focus her discussion she is simulating her readers' response and using their interest to both guide and evaluate her plans. And although some of these goals deal with content, they do not take the form of proposed or even proto text. The range of what the writer could say, given either plan, is enormous.

In the hierarchical model of composing proposed by the rhetorical hypothesis, sentence-level planning is embedded within rhetorical planning and is, in general, guided by it. As Bereiter and Scardamalia have suggested, rhetorical or "whole text" planning is a distinctive feature of mature writing (1981). Such writing, unlike conversation, requires a vision of the entire structure of a piece of discourse and the integration of all its constraints. Although children can be stimulated to do whole text planning, the ability to do it spontaneously and to integrate such planning with prose production is part of what develops as children learn to write.

Predictions

One way to test these two models will be to look at predictions they make about the content of pauses and the nature of planning. To begin, a strictly bottom-up linguistic hypothesis would predict only local planning of immediate linguistic choices ("what to say next"). A top-down, or rhetorical, theory would expect planning to integrate more abstract rhetorical concerns, such as audience, genre, and purpose, which might have no simple linguistic relationship to the text. Furthermore, a rhetorical theory would predict that such planning would take conscious processing time and have content--it would not exist as mere tacit knowledge or an intuitive "end in view," even though such tacit knowledge would also play a role. Finally, one would expect long pauses to reflect lengthier, more complex planning, rather than the preparation for a larger burst of speech, as Chafe has suggested (1979), or a longer piece of text. A strict linguistic hypothesis would thus expect patterns in pausing and planning to reflect patterns in the text. It would predict a correlation between pauses and paragraph boundaries, idea units, or other major units of the text. And one would expect the content or goal of such planning to be text production.

METHOD

To test these predictions about planning, one must know what writers are actually thinking about during their pregnant pauses; we must be able to look at the content of planning. Therefore these studies are based on analyses of thinking-aloud protocols of four subjects (three expert and one novice writer) asked to verbalize their flow of thought as they composed. We should emphasize that such protocols do not depend on writers' retrospections but are designed to

capture concurrent thought--the immediate contents of short-term memory as one is writing. If accurately handled, thinking aloud protocols yield enormous amounts of information without significantly changing the focus or content of thought. Giving a protocol is much like talking to oneself while writing. Naturally, a verbalization will not capture all the associations, resonance, and richness of a given thought, but it will tell us that such a thought was occurring. More importantly, protocols give us an extraordinarily detailed, blow-by-blow record of a writer's constantly shifting conscious attention, and by capturing the flow of concurrent thought processes, protocols avoid the unreliability of retrospective generalization (Flower and Hayes, in press, c).

The Episodic Structure of Composing

The goal of our study, then, was to use a protocol's window on thought processes to more fully explicate the content of silent pauses described in other research. But because verbalization itself takes time and stretches out the writing process, a direct comparison of silent pause patterns and vebalized planning is not possible. However, the thought in verbal protocols falls into an important and robust pattern of its own which we have described as "composing episodes." The boundaries between these episodes, we will argue, are the source of many of the long "pregnant" pauses under question. Let us, therefore, examine the nature of these composing episodes.

Composing episodes are units in the process of the writer, rather than his or her written product. We initially noticed that writers appeared to work in units of concentration or periods of sustained focus, and, more importantly, found that the boundaries between these composing episodes could be agreed upon by independent readers. In the protocols of three subjects analyzed in detail (the tape of one expert writer was no longer available) these episodes ranged in length from 1 to 33 lines of typescript, lasting from 7 seconds to 12 minutes, with an average length of 1 minute 45 seconds and an average of 10 clauses per episode (see Table 1).

In our analysis we will occasionally separate episodes into "major" episodes, which are clearly autonomous episodes with strong boundaries, and "minor" episodes, which have weaker boundaries or stronger connections to adjacent episodes. Sets of these minor episodes typically cluster together to form a functional unit--they work as sub-episodes within the more clearly bounded unit of a major episode. The following example will clarify this distinction. It comes

from the very beginning of an expert protocol and shows two brief major episodes (74 and 47 seconds) and the beginning of one longer major episode (13 minutes) composed of three minor episodes. The boundaries between major episodes are indicated by double slash marks; those between minor episodes by a single mark.

There are a number of features worth mention here. First, if this writer's performance were merely observed, it would appear to be a long 160 seconds of pausing, broken only by the act of shutting the door and ended by the transcription of the first sentence. The protocol, however, reveals a substantial and complex body of planning. Even during verbalizing, pauses still occur and those of 2 seconds or more are noted with superscript numbers. The coding of the protocol reflects our model (Hayes and Flower, 1980; Flower and Hayes, in press, a) and distinguishes between the processes of Planning, Translating (producing written text), and Reviewing. Here text produced by the writer is underlined once, reading is underscored twice.

Note that the first episode ends with a metacomment--a familiar enough ploy for diverting attention from the task at hand. Episode two begins with a renewed attack on the assignment, which told subjects to work as if they were free-lance writers. The third episode breaks into smaller internal units or minor episodes. Like many of the episodes focused on the act of Translating or producing prose, it is relatively long and broken into minor episodes by brief evaluative comments and attention to side issues; yet the thread of composition is not lost. Such episodes seem directed by an overall plan that can sustain changes in topic and can cross paragraph boundaries. In this case, notice how adroitly the fragment of text produced in Episode 3 responds to the audience analysis, implicit goals, and plans which preceded it. As we will try to show in the rest of this paper, these episodes are goal-directed planning units in which writers work.

Figure 1

Episodes in an Expert Writer's Protocol

Episode 1

My Job[2] for a young[2] - Oh I'm to describe my job for a young thirteen to fourteen year-old teenage female audience - Magazine - Seventeen.[3] -a- My immediate reaction is that it's utterly impossible. I did read Seventeen, though - I guess I wouldn't say I read it[4.2] -a- I looked at it, especially the ads, so

the idea would be to describe what I do to someone like myself when I read - well not like myself, but adjusted for 2 - well twenty years later. 5.2 -a- Now what I think of doing really is that - until the coffee comes I feel I can't begin, so I will shut the door and feel that I have a little bit more privacy,//

Episode 2

6.2 -um- Also the mention of a free-lance writer is something I've - I've no experience in doing and my sense is that it's a - a formula which I'm not sure I know, so I suppose what I have to do is 2 -a- invent what the formula might be, and - and then try to 3.8 -a- try to include 4.2 - events or occurrences or attitude or experiences in my own job that would 3.6 -a- that could be - that

Episode 3a

could be conveyed in formula so let's see 2 -// I suppose one would want to start - by writing something - that would -a- attract the attention of the reader - of that reader and 2 -a- I suppose the most interesting thing about my job would be that it is highly unlikely that it would seem at all interesting to someone of that age 2 - So I might start by saying something like - Can you imagine yourself spending a day - Many days like this - waking up at 4:30 a.m., making a pot of coffee...looking around...my - looking around your house, letting in your cats... -a- walking out - out with coffee and a book and watching the dawn materialize...I actually do this...although 4:30's a bit early, perhaps I should say 5:30 so it won't seem - although I do get up at 4:30 -a- watching the dawn materialize and starting to work - to work by reading - reading the manuscript - of a Victorian writer...with a manuscript of a...a Victorian writer...a person with a manuscript of a student - Much like yourself - Much like - Much like -a- a student or a book by Aristotle they've heard of Aristotle or - who could I have it be by - Plato probably When it gets to be - When you've... -a- finished your coffee and whatever you had to do (Oh thanks) - whatever - now I've just gotten coffee - finished your coffee (mumbling)...when you've finished your coffee and 3 -a- foreseen - and 2 -a- ummmmmm - when you've finished your coffee, you dress and drive - about three miles to the university where you spend another -

where you spend - you spend hours - you spend about - oh what - four or five - supposed to be four hours - about three hours a day - about three hours teaching - many more hours talking to students - talking to - talking to

Episode 3b

other teachers...Um 6.8 -/ should I (mumble) - the thing is about saying teachers - the - the teenage girl is going to think teachers like who she has, and professor I always feel is sort of pretentious and a word usually - usually I say teacher, but I know 2 that means 7.6 I...It's unfortunate now in society we

Episode 3c

don't - but that that isn't a prestige occupation./. Talking to other people like yourselves - that's whoever it may be - other people at your job - other - other people like yourself - uh a lot like yourself but - talking to other people like yourself - going to meetings...committee meetings...and doing all this for nine months so that the other three...and doing all this for three months - okay - nine months...If you can imagine that....

Evidence for an Episodic Structure

Our analysis of the content of "pregnant pauses" will rest on two assertions we have attempted to verify:

1. That the "composing episodes" are real; that is, that they represent meaningful and verifiable units of concentration in which writers normally work.

2. That by looking at the boundaries which occur between episodes we are in fact looking at many of the longer, "pregnant" pauses noted by observational research.

Although these episodic patterns had intuitive validity to readers of the protocols, we looked for converging evidence to support their reality and the reliability of our boundary judgments. One content free indication of a boundary comes in the form of signal words such as "all right," "let's see," and "okay." In three of our four writers these signal words clustered significantly ($p < .001$) around episode boundaries (i.e., appearing in either the immediately preceeding or succeeding clauses). The fourth writer simply didn't use signal words. Such expressions seem to indicate a sense of opening or closure as in "okay, now..." or "that's okay." Or they worked as

filler in the writer's transition from one episode to the next. (Although many boundaries are sharply defined points, some are one to three clause transitional units containing false closures, false starts, and metacomments.)

Most of the evidence for episodes and their boundaries, however, depends on the internal logic of the protocol itself. As Table 2 shows, when judges study the protocol carefully and know it well, they achieve high reliability in judging boundaries. These "knowledgeable" judges were merely instructed to look for units of concentration in the writer's process and to mark a boundary when they saw the writer shifting focus, changing a train of thought, or setting up a new plan. These judgments did show a threshold effect (as verified by the Gutman scaling technique)--some judges simply had broader criteria for selecting boundaries and noted more of them. However, even with these differences, out of a total of 248 boundaries selected by our four knowledgeable judges, two or more judges agreed on 70% of these boundaries. A random selection predicted by a multinomial probability test would have yielded only a 20% agreement.

For comparison, the protocols were then judged by four more readers whom we called "intuitive judges" because they had not studied the protocols and were given no instructions beyond "Use your intuition to mark what you see as meaningful episodes in the process of the writer's thought." As a control they were given a set of markers slightly greater than the number of major and minor episodes noted by the knowledgeable judges. As one might expect, the intuitive judges created many more idiosyncratic boundaries (i.e., those chosen by only one judge). Nevertheless, of the 290 boundaries they marked, two or more judges agreed on 50% of the boundaries. They showed even stronger agreement on the "official" boundaries (i.e., those selected by two or more knowledgeable judges). Two or more of the intuitive judges selected over 90% of these boundaries (whereas, a probability test would predict only 13%) and three or more judges agreed on 73% (compared to the even smaller probability prediction of only .5% agreement). Finally, we asked a group of twenty-two writing researchers attending a seminar on protocol analysis to make intuitive judgments on yet another protocol and found that eight readers or more agreed on 70% of all the boundaries chosen by the group (here probability would predict such agreement on only .00000118% of the boundaries). We think these results are remarkably strong.

The goal of this initial analysis was not to create a well-specified definition of episodes, but simply to gather prima facie evidence that they do indeed exist as complex, yet strongly visible units within the composing process. We can sum up the findings in this way: You can't expect every reader to agree on all the boundaries; yet major episode boundaries have a high intuitive discernability. The selection of minor or sub-episode boundaries will be more idiosyncratic since readers respond to a wide range of events such as process shifts between planning, translating, and editing; shifts in topic; and the intrusion of metacomments. However, knowledgeable readers--that is, people who carefully study the content and logic of the entire protocol--will come to high agreement in choosing episodes. The importance of "knowing" the protocol also reveals a key fact about episodes. Episodes are not like paragraphs of a text, organized around a central topic which a casual reader can easily follow. Instead, episodes seem to be organized around goals, so that one episode could include various topics and various processes from planning to editing--all tied together by their relevance to the writer's current plan or goal. Readers who know the protocol well are more aware of this overall structure.

Episodes and Pauses

For our purposes here episode boundaries, especially beginnings, are interesting for two reasons. First, because boundaries are pivotal points at which writers are breaking concentration and changing focus, they are likely to be decision points in the writer's ongoing planning process. Secondly, they appear to be the source of many of the longer, more tantalizing "pregnant" pauses others have observed. Matsuhashi's category of "hesitant pauses" (longer than one second) contained a number of such significant pauses. For example, writers of expository essays paused an average of 20.9 seconds before writing sentences which began a paragraph (Matsuhashi, 1980). (Bear in mind that 20 seconds is a long time--in it you could take a leisurely walk down a long flight of stairs, thinking all the way.) Are subjects using that 20 seconds to assemble the text of the ensuing paragraph, or is the text simply the visible output of a more complex planning process?

Protocols allow us to turn what would be a long "hesitant pause" into verbalized thought, at least in part. Even in protocols people fall silent. Some of this time is taken up by the

mechanics of memory search, which does take measurable time, some by the act of recoding non-verbal thought, and some is simply due to the natural cussedness of subjects. Whatever their source, the major silent pauses in protocols also occur at episode boundaries. Pauses at boundaries averaged a significant 2.43 seconds longer than other pauses--making them, on the average, almost twice as long. Episode boundaries, it appears, are points in the composing process which are rich in information. The combination of silent pausing, verbalized planning, and transitional groping we have observed at boundaries suggests that such boundaries are not only significant in themselves, but appear to coincide with the major silent planning pauses seen in observation. Protocols, we hoped, would open a window onto the intellectual content of these pregnant pauses.

RESULTS

Let us turn now to the predictions our two initial hypotheses would make about the nature of planning during pauses in silent composition or at episode boundaries in protocols. Since a strict text-based linguistic hypothesis would predict the predominance of sentence-level or textual planning we might expect:

1. That paragraph boundaries would be a strong predictor of major episode boundaries (either the beginning or the end).

2. Or that new ideas or sentence-level shifts in logical development would be a good predictor of episode beginnings.

On the other hand, a rhetorical hypothesis, based on a problem-solving model of cognitive processing, would predict:

1. That goal-related planning activity would be the best predictor of episode beginnings.

2. And that the planning which goes on at these points would focus on rhetorical concerns above the level of text itself and on directing and monitoring the writer's own process.

Prediction 1. As Table 3 shows, paragraphs are surprisingly poor predictors of major

episode boundaries. Although a chi square test shows that paragraphs and boundaries are "significantly related" for two of our subjects, the signal detection test is much more informative. Such a test is analagous to a sentry with a loaded gun primed to shoot (detect) certain intruders (signals). The test of the sentry is the percentage of intruders he successfully detects, the percent he misses, and the percent he incorrectly shoots. By this test paragraphs are rather poor detectors: they capture an average of only 12% of the actual major boundaries and miss 88%. As the significance test suggests, when a paragraph occurs it is likely to be related to an episode boundary, but paragraphs can't fully account for the existence and logic of episodes.

Prediction 2. Perhaps paragraphs are too large a unit or too infrequent an event. On the suggestion of James J. Murphy we narrowed our focus to the logical idea structure of the written text, looking for shifts in topoi or topics. We broke the text the writer produced into units based on a condensed four part version of Aristotelian topics so that our basic categories were: definition, comparison, cause and effect, and evidence (Corbett, 1971). In general, we found that logical topics, thus broadly defined, were very effective in categorizing most of the material writers produced (these logical topic shifts gave us roughly sentence-sized units). However, these shifts in topic were no better at detecting episode boundaries than paragraphs had been--despite their very high frequency in the protocol. As Table 4 shows, the relationship of logical topics to boundaries was not significant and they averaged a success rate as signal detectors of only 21%.

Prediction 3. If episode boundaries are not tied to major boundaries in the text itself, what are writers doing? Table 5 shows an attempt to tabulate the mental actions or content of thought found at episode beginnings. (We coded the first meaningful unit, usually a clause.) As a test of our rhetorical hypothesis we made a gross categorization of goal-related actions versus all other actions and found strong support for the prediction that the planning and pausing that occurs at episode boundaries is related to creating or returning to rhetorical goals. Although individual writers varied between 55% to 80%, we found that nearly 70% of the comments at episode beginnings are related to goals and nearly 50% of them are devoted to actually setting goals. Inter-rater reliability in identifying goals was 84%. Of course, there was the possibility that goals were a constant, widely distributed feature of protocols. However, an analysis of the novice protocol showed a significant ($p < .01$) difference in the frequency of goals at episode

beginnings and middles: goals appeared in 58% of the clauses at episode beginnings but in only 26% of the clauses in the middle. To sum up, goal-related activity appears to be a strong predictor of episode beginnings and suggests that planning pauses have many dimensions above and beyond the decisions of "what to say next."

Prediction 4. What form does rhetorical planning take? A detailed analysis of the content and organization of planning at episode boundaries is beyond the scope of this paper, but a brief discussion of the categories appearing in Table 5 will suggest some of the key features of such planning (cf. Flower and Hayes, 1980).

The most obvious form of goal setting is simply reading and elaborating on the assignment. More important, and certainly more difficult is the act of creating useful, operational goals for oneself. An instance of such a goal, although not located at the beginning of an episode, comes at the end of episode two in our example (see Figure 1) in which the writer literally tries to invent a discourse schema from which she will then work--the "formula" for a magazine article. Finally, goal-setting also takes the form of reviewing or reinstating goals created earlier. In some cases the writer appears to be reconsidering or evaluating the goal itself, in others, simply reinstating it in short-term memory as a new point of departure.

A second kind of goal setting is devoted to process goals. Unlike content goals which govern things one might say, process goals are instructions and plans the writer gives himself for directing his own composing process. In the example in Figure 1, episode three begins with a statement which would have been double coded as both a content goal and a process goal. In it the writer decides to shift from planning to producing text. The process goal shows the writer actively at work directing and monitoring her own process. Later she will mention goals for plans to reread, and to write a transition. This ability to direct and monitor one's own process seems to be an important part of an experienced writer's repertory and related to the powers of metacomprehension children develop as they learn to write (Bereiter and Scardamalia, in press).

Although this data could not support any comparison of expert novice differences, it is interesting to note a confirmation of Perl and Shaughnessy's predictions about inexperienced writers. Although our novice showed a high percentage of actions we coded as goal setting,

nearly half of those were instances of reviewing the assignment or repeating previous goals, rather than elaborating or developing the goal structure.

Our final category, "Acting on Goal," includes statements in which the writer was clearly acting on a previously enunciated goal that could be pinpointed in the text by independent raters. This category captures those important instances in which writers mentally "pop up to" or recall a previous goal and begin to carry it out by writing text or generating ideas which are a direct fulfillment of that plan or goal.

We think the series of studies reported here support a number of conclusions.

1. Planning goes on at many levels. Sentence-level linguistic planning is a major constituent of the writing process--sentences do not simply emerge once one has the general idea. On the other hand, sentence-level planning is only a part of the process of the mature or experienced expository writer. Writers spend time and conscious attention creating guiding rhetorical plans which represent not only the audience and the task, but the writer's own goals. It is not enough to think of writing as simply a process of text production or deciding what to say next. However, an important part of being a skilled writer is knowing not only how to do this rhetorical planning, but how to embed sentence-level planning within it--how to turn intentions and knowledge into text.

2. The composing process has an episodic pattern of its own which is not dictated by the patterns of the text. Writers appear to work in composing "episodes" or units of concentration which are organized around a goal or plan. Understanding the overall architecture of these episodes and the logic which begins and ends them will, we think, tell us a great deal about how writers combine planning and text production.

3. The beginnings of individual episodes in the writers we studied are clearly dominated by goal-setting activities. And this continually elaborated network of plans and goals gives logic and structure to the episodes which follow. This network is, we believe, one of the chief outputs of the writer's pregnant pause. But because such plans are rarely expressed in the eventual text, they remain largely invisible to teachers of writing. And yet there is good reason to think that some of the crucial differences between good and poor writers lies just here, in the kind and

quality of goals writers give themselves and in their ability to use this planning to guide their own composing process.

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